

What is claimed is:

1. A method of communication between earth terminals and satellites, comprising the steps of:

providing a plurality of satellites, each satellite having at least one receiver tunable to a selected frequency;

5 providing a plurality of earth terminals adapted to send messages to, and receive messages from, the plurality of satellites;

defining at least one subband of the frequency spectrum;

assigning at least one subband to each satellite receiver;

assigning each earth terminal to one of the satellite receivers;

10 selecting a center frequency for the communication channel for each receiver within the subband assigned to that receiver;

tuning each satellite receiver to the communication channel selected for that receiver;

15 informing at least the listening earth terminals of the communication channel selected for the receiver to which each earth terminal is assigned;

transmitting messages from the earth terminals to the respective, assigned satellite receivers at the selected communication channel for each receiver.

2. The method of claim 1 wherein said satellite providing step comprises providing a plurality of satellites, each satellite having at least one receiver tunable to a selected frequency and at least one satellite having a plurality of receivers, each receiver being tunable to a selected frequency.

3. The method of claim 1 wherein said satellite providing step comprises providing a plurality of satellites, each satellite having a plurality of receivers, each receiver being tunable to a selected frequency.

4. The method of claim 1 wherein said subband defining step comprises defining each subband based at least partly on channel spacing.

5. The method of claim 1 wherein said subband defining step comprises defining each subband based at least partly on hard power threshold.

6. The method of claim 1 wherein said subband defining step comprises defining each subband based at least partly on allowable distance from grid channels.

7. The method of claim 1 wherein said subband defining step comprises defining each subband based at least partly on channel exclusions.

8. The method of claim 1 wherein said subband defining step comprises defining each subband based at least partly on range.

9. The method of claim 1 wherein said subband defining step comprises defining each subband based on channel spacing, hard power threshold, allowable distance from grid channels, channel exclusions and range.

10. The method of claim 1 wherein said subband assigning step comprises assigning at least two subbands to one satellite receiver.

11. The method of claim 1 wherein said subband assigning step comprises the steps of:

providing at least one gateway control center;

assigning a subband to each gateway control center; and

associating each gateway control center and its assigned subband with a satellite receiver such that the subband is assigned to the satellite receiver.

12. The method of claim 11 wherein said subband assigning step further comprises the step of providing at least one gateway earth station for receiving and transmitting communications between the satellite and the gateway control center.

13. The method of claim 11 wherein said earth terminal assigning step comprises the steps of:

assigning each earth terminal to a gateway control center;

assigning each earth terminal to the satellite receiver associated with the gateway control center for the earth terminal.

14. The method of claim 11 further comprising the step of changing over time the satellite receiver to which a gateway control center is associated.

15. The method of claim 1 further comprising the step of changing over time the at least one subband assigned to each satellite receiver.

16. The method of claim 1 further comprising the step of changing over time the satellite receiver to which an earth terminal is assigned.

17. The method of claim 1 wherein said communication channel selecting step comprises selecting as a center frequency for the communication channel for each receiver one frequency within the subband assigned to that receiver based at least partly on the factor of power sampling.

18. The method of claim 1 wherein said communication channel selecting step comprises selecting as a center frequency for the communication channel for each receiver one frequency within the subband assigned to that receiver based at least partly on the factor of grid preference.

19. The method of claim 1 wherein said communication channel selecting step comprises selecting as a center frequency for the communication channel for each receiver one frequency within the subband assigned to that receiver based at least partly on the factor of quality.

20. The method of claim 1 wherein said communication channel selecting step comprises selecting as a center frequency for the communication channel for each receiver one frequency within the subband assigned to that receiver based on the factors of power sampling, grid preference and quality.

21. The method of claim 20 wherein said communication channel selecting step further comprises weighing the power sampling factor more heavily than the grid preference factor.

22. The method of claim 21 wherein said communication channel selecting step further comprises weighing the grid preference factor more heavily than the quality factor.

23. The method of claim 1 wherein said message transmitting step further comprises the steps of:

- (a) the earth terminal transmitting an acquire burst to a satellite receiver;
- (b) the satellite on which the satellite receiver resides transmitting a slot assignment to the earth terminal; and
- (c) the earth terminal transmitting a communicate burst to the satellite receiver in accordance with the slot assignment.

24. The method of claim 23 wherein step (a) further comprises the earth terminal transmitting an identifier to the satellite receiver and wherein step (b) further comprises the satellite transmitting the identifier to the earth terminal.

25. The method of claim 23 further comprising the step of the satellite determining and transmitting to the earth terminal the frequency offset between the center frequency of the receiver acquire burst and the center frequency of the communication channel.

26. The method of claim 23 further comprising the step of the satellite transmitting to the earth terminal information relating to the time taken for the acquire burst to reach the satellite receiver.

27. A method of communication between earth terminals and at least one satellite, comprising the steps of:

providing at least one satellite, each satellite having at least one receiver, each receiver being configured to receive messages having a size of one of a plurality of sizes;

providing a plurality of earth terminals adapted to send messages to, and receive messages from, the at least one satellite;

tracking the load of messages on each receiver; and

reconfiguring at least one receiver to receive messages having a different one of the plurality of sizes in response to the message load.

28. The method of claim 27 wherein said satellite providing step comprises providing at least two receivers.

29. The method of claim 28 wherein said satellite providing step comprises providing at least two receivers, each receiver being configured to receive messages having a size of one of a plurality of sizes.

30. The method of claim 29 wherein said satellite providing step comprises providing at least two receivers, each receiver being configured to receive messages having a size of one of a plurality of predetermined sizes.

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31. The method of claim 27 further comprising the step of broadcasting to the earth terminals the message length for which a receiver is currently configured.

32. A communication system, comprising:
a plurality of earth terminals for sending messages;
at least one satellite having at least one satellite receiver for receiving messages from said earth terminals; and

5 at least one gateway control center for storing subband information and assigning to at least one satellite the subband information;

wherein said at least one satellite determines a center frequency for a communication channel between said satellite receiver and at least one of said earth terminals using the subband information.

33. The communication system of claim 32 wherein said at least one satellite is assigned different subband information over time.

34. The communication system of claim 33 wherein said at least one satellite is assigned first subband information from a first gateway control center at a first time and wherein said at least one satellite is assigned second subband information from a second gateway control center at a second time.

35. A communication system, comprising:
a satellite having a plurality of satellite receivers, each said satellite receiver being selectively configurable to receive messages of one of a plurality of sizes; and

5 a plurality of earth terminals for sending messages to said satellite receivers, each message being of a length that is one of the plurality of sizes;

wherein at least one of said satellite receivers is configured to receive messages of a first size at a first time and is configured to receive messages of a second size at a second time.

36. The communication system of claim 35 wherein said satellite transmits a first size of messages received from said earth terminals and causes at least one of said earth terminals to be configured to receive messages of the second size at the second time.

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